ENTERTAINMENT FOR MEN

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Annotation

Won the Nebula Award for Best Novella in 1973.
Nominated for the Hugo Award for Best Novella in 1972.

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A Meeting with Medusa
by Arthur C. Clarke

1. A Day to Remember

The *Queen Elizabeth* was over three miles above the Grand Canyon, dawdling along at a comfortable hundred and eighty, when Howard Falcon spotted the camera platform closing in from the right. He had been expecting it—nothing else was cleared to fly at this altitude—but he was not too happy to have company. Although he welcomed any signs of public interest, he also wanted as much empty sky as he could get. After all, he was the first man in history to navigate a ship three-tenths of a mile long.

So far, this first test flight had gone perfectly; ironically enough, the only problem had been the century-old aircraft carrier *Chairman Mao,* borrowed from the San Diego Naval Museum for support operations. Only one of *Mao's* four nuclear reactors was still operating, and the old battle-wagon's top speed was barely thirty knots. Luckily, wind speed at sea level had been less than half this, so it had not been too difficult to maintain still air on the flight deck. Though there had been a few anxious moments during gusts, when the mooring lines had been dropped, the dirigible had risen smoothly, straight up into the sky, as if on an invisible elevator. If all went well, *Queen Elizabeth IV* would not meet *Chairman Mao* again for another week.

Everything was under control, all test instruments gave normal readings. Commander Falcon decided to go upstairs and watch the rendezvous. He handed over to his second officer, and walked out into the transparent tubeway that led through the heart of the ship. There, as always, he was overwhelmed by the spectacle of the largest single space ever enclosed by man.

The ten spherical gas cells, each more than a hundred feet across, were ranged one behind the other like a line of gigantic soap bubbles. The tough plastic was so clear that he could see through the whole length of the array, and make out details of the elevator mechanism, more than a third of a mile from his vantage point. All around him, like a three-dimensional maze, was the structural framework of the ship the great longitudinal girders running from nose to tail, the fifteen hoops that were the circular ribs of this sky-borne colossus, and whose varying sizes defined its graceful, streamlined profile.

At this low speed, there was little sound, merely the soft rush of wind over the envelope and an occasional creak of metal as the pattern of stresses changed. The shadowless light from the rows of lamps far overhead gave the whole scene a curiously submarine quality, and to Falcon this was caused by the spectacle of the translucent gasbags. He had once encountered a squadron of large but harmless jellyfish, pulsing their mindless way above a shallow tropical

reef, and the plastic bubbles that gave *Queen Elizabeth* her lift often reminded him of these especially when changing pressures made them crinkle and scatter new patterns of reflected light.

He walked down the axis of the ship until he came to the forward elevator, between gas cells one and two. Riding up to the Observation Deck, be noticed that it was uncomfortably hot, and dictated a brief memo to himself on his pocket recorder.

The *Queen* obtained almost a quarter of her buoyancy from the unlimited amounts of waste heat produced by her fusion power plant. On this lightly loaded flight, indeed only six of the ten gas cells contained helium, the remaining four were full of air. Yet she still carried two hundred tons of water as ballast. However, running the cells at high temperatures did produce problems in refrigerating the access ways, it was obvious that a little more work would have to be done there.

A refreshing blast of cooler air hit him in the face when he stepped out onto the Observation Deck and into the dazzling sunlight streaming through the plexiglass roof. Half a dozen workmen, with an equal number of superchimp assistants, were busily laying the partly completed dance floor, while others were installing electric wiring and fixing furniture. It was a scene of controlled chaos, and Falcon found it hard to believe that everything would be ready for the maiden voyage, only four weeks ahead. Well, at least it was not *his* problem, thank goodness. He was merely the Captain, not the Cruise Director.

The human workers waved to him, and the “simps” flashed toothy smiles, as he walked through the confusion, into the already completed Skylounge. This was his favourite place in the whole ship, and he knew that once she was operating he would never again have it all to himself. He would allow himself just five minutes of private enjoyment.

He called the bridge, checked that everything was still in order, and relaxed into one of the comfortable swivel chairs. Below, in a curve that delighted the eye, was the unbroken silver sweep of the ship’s envelope. He was perched at the highest point, surveying the whole immensity of the largest vehicle ever built. And when he had tired of that, all the way out the horizon, was the fantastic wilderness carved by the Colorado River in half a billion years of time.

Apart from the camera platform (it had now fallen back and was filming irom amidships), he had the sky to himself. It was blue and empty, clear down to the horizon. In his grandfather’s day, Falcon knew, it would have been streaked with vapour trails and stained with smoke. Both had gone: the aerial garbage had vanished with the primitive technologies that spawned it, and the long-distance

transportation of this age forced to beyond the stratosphere for any sight or sound of it to reach Earth again, the lower atmosphere belonged to the birds and the clouds and now to *Queen Elizabeth IV*.

It was true, as the old pioneers had said at the beginning of the twentieth century: this was the only way to travel, in silence and luxury, breathing the air around you and not cut off from it, near enough to the surface to watch the ever-changing beauty of land and sea. The subsonic jets of the 1980s, packed with hundreds of passengers seated ten abreast, could not even begin to match such comfort and spaciousness.

Of course, the *Queen* would never be an economic proposition, and even if her projected sister ships were built, only a few of the world's quarter of a billion inhabitants would ever enjoy this silent gliding through the sky. But a secure and prosperous global society could afford such follies and indeed needed them for their novelty and entertainment. There were at least a million men on Earth whose discretionary income exceeded a thousand new dollars a year, so the *Queen* would not lack for passengers.

Falcon's pocket communicator beeped. The copilot was calling from the bridge.

"OK for rendezvous, Captain? We've got all the data we need from this run, and the TV people are getting impatient."

Falcon glanced at the camera platform, now matching his speed a tenth of a mile away.

"OK," he replied. "Proceed as arranged. I'll watch from here."

He walked back through the busy chaos of the Observation Deck so that he could have a better view amidships. As he did so, he could feel the change of vibration underfoot, by the time he had reached the rear of the lounge, the ship had come to rest. Using his master key, he let himself out onto the small external platform flaring from the end of the deck, half a dozen people could stand here, with only low guardrails separating them from the vast sweep of the envelope and from the ground, thousands of feet below. It was an exciting place to be, and perfectly safe even when the ship was travelling at speed, for it was in the dead air behind the huge dorsal blister of the Observation Deck. Nevertheless, it was not intended that the passengers would have access to it, the view was a little too vertiginous.

The covers of the forward cargo hatch had already opened like giant trap doors, and the camera platform was hovering above them, preparing to descend. Along this route, in the years to come, would travel thousands of passengers and tons of supplies. Only on rare occasions would the *Queen* drop down to sea level and dock with her floating base.

A sudden gust of cross-wind slapped Falcon's cheek, and he tightened his grip on the guardrail. The Grand Canyon was a bad place for turbulence, though he did not expect much at this altitude. Without any real anxiety, he focused his attention on the descending platform, now about a hundred and fifty feet above the ship. He knew that the highly skilled operator who flying the remotely controlled vehicle had performed this simple maneuver a dozen times already, it was inconceivable that he would have difficulties, he seemed to be reacting rather sluggishly. That last gust had drifted the platform almost to the edge of the open hatchway. Surely the pilot would have corrected before this… Did he have a control problem? It was unlikely, these remotes had multiple-redundancy, fail-safe takeovers, any number of backup systems. Accidents were almost unheard of.

There he went again, off to the left. Could the pilot be *drunk?*

Improbable though that seemed, Falcon considered it seriously for a moment. Then he reached for his microphone switch.

Once again, without warning, he was slapped violently in the face. He barely felt it, for he was staring in horror at the camera platform. The operator was fighting for control, trying to balance the craft on its tail, but he was only making matters worse. The oscillations increased by degrees, forty, sixty, ninety…

"Switch to automatic, you fool!" Falcon shouted uselessly into his microphone. "Your manual control's not working!"

The platform flipped over on its back. The jets no longer supported it, but pushed it swiftly downward. They had suddenly become allies of the gravity they had fought until this moment.

Falcon never heard the crash, though he felt it, he was already inside the Observation Deck, racing for the elevator that would take him down to the bridge. Workmen shouted at him anxiously, asking what had happened. It would be many months before he knew the answer to that question.

Just as he was stepping into the elevator cage, he changed his mind. if there was a power failure? Better be on the safe side, even if it took longer and time was the essence. He began to run down the spiral stairway circling the shaft.

Halfway down he paused for a second to inspect the damage. That damed platform had gone clear through the ship, rupturing two of the gas cells as it did so. They were still collapsing slowly, in great falling veils of plastic. He was not worried about the loss of lift, the ballast could easily take care of that, as long as eight cells remained intact. Far more serious was the possibility of structural damage. Already he could hear the great latticework around him groaning and protesting under its abnormal loads. It was not enough to have sufficient lift, unless it was properly distributed, the ship could break

her back.

He was just resuming his descent when a superchimp, shrieking with fright, came racing down the elevator shaft, moving with incredible speed, hand over hand, along the *outside* of the latticework. In its terror, the poor simp had torn off its company uniform, perhaps in an unconscious attempt to regain the freedom of its ancestors.

Falcon, still descending as swiftly as he could, watched its approach with alarm. A distraught simp was a powerful and potentially dangerous animal, especially if fear overcame its conditioning. As it overtook him, it started to call out a string of words, but they were all jumbled together, and the only one he could recognise was a plaintive, frequently repeated "boss'. Even now, Falcon realised, it looked toward humans for guidance. He felt sorry for the creature, involved in a man-made disaster beyond its comprehension, and for which it bore no responsibility.

It stopped opposite him, on the other side of the lattice, there was nothing to prevent it from coming through the open framework if it wished. Now its face was only inches from his, and he was looking straight into the terrified eyes. Never before had he been so close to a simp and able to study its features in such detail. He felt that strange mingling of kinship and discomfort that all men experience when they gaze thus into the mirror of time.

His presence seemed to have calmed the creature. Falcon pointed up the shaft, back toward the Observation Deck, and said very clearly and precisely:

"Boss—boss—go." To his relief, the simp understood, it gave him a grimace that might have been a smile, and at once started to race back the way it had come. Falcon had given it the best advice he could. If any safety remained aboard the *Queen,* it was in that direction. But his duty lay in the other.

He had almost completed his descent when, with a sound of rending metal, the vessel pitched nose down, and the lights went out. But he could still see quite well, for a shaft of sunlight streamed through the open hatch and the huge tear in the envelope. Many years ago he had stood in a great cathedral nave watching the light pouring through the stained-glass windows and forming pools of multi-colored radiance on the ancient flagstones. The dazzling shaft of sunlight through the ruined fabric high above reminded him of that moment. He was in a cathedral of metal, falling down the sky.

When he reached the bridge, and was able for the first time to look outside, he was horrified to see how close the ship was to the ground. Only three thousand feet below were the beautiful and deadly pinnacles of rock and the red rivers of mud that were still carving

their way down into the past. There was no level area anywhere in sight where a ship as large as the *Queen* could come to rest on an even keel.

A glance at the display board told him that all the ballast had gone. However, the rate of descent had been reduced to a few yards a second, they still had a fighting chance.

Without a word, Falcon eased himself into the pilot's seat and took over such control as still remained. The instrument board showed him every thing he wished to know, speech was superfluous. In the background he could hear the Communications Officer giving a running report over the radio. By this time, all the news channels of Earth would have been preempted, and he could imagine the utter frustration of the programne controllers. One of the most spectacular wrecks in history was occurring, without a single camera to record it. The last moments of the *Queen* would never fill millions with awe and terror, as had those of the *Hindenburg,* a century and a half before.

Now the ground was only about seventeen hundred feet away, still coming up slowly. Though he had full thrust, he had not dared to use it, lest the weakened structure collapse, but now he realised that he had no choice. The wind was taking them toward a fork in the canyon, where the river was split by a wedge of rock like the prow of some gigantic, fossilised ship of stone. If she continued on her present course, the *Queen* would straddle that triangular plateau and come to rest with at least a third of her length jutting out over nothingness, she would snap like a rotten stick.

Far away, above the sound of straining metal and escaping gas, came the familiar whistle of the jets as Falcon opened up the lateral thrusters. The ship staggered, and began to slew to port. The shriek of tearing metal was know almost continuous and the rate of descent had started to increase ominously. A glance at the damage-control board showed that cell number five had just gone.

The ground was only yards away. Even now, he could not tell whether his manoeuvre would succeed or fail. He switched the thrust vectors over to vertical, giving maximum lift to reduce the force of impact.

The crash seemed to last forever. It was not violent, merely prolonged, and irresistible. It seemed that the whole universe was falling about them.

The sound of crunching metal came nearer, as if some great beast were eating its way through the dying ship.

Then the floor and ceiling closed upon him like a vice.

2. “Because it’s There”

“Why do you want to go to Jupiter?”

“As Springer said when he lifted for Pluto—‘because it’s there’.”

“Thanks. Now we’ve got *that* out of the way—tell me the real reason.

Howard Falcon smiled, though only those who knew him well could have interpreted the slight, leathery grimace. Webster was one of them; for more than twenty years they had been involved in each other’s projects. They had shared triumphs and disasters including the greatest disaster of all.

“Well, Springer’s cliche is still valid. We’ve landed on all the terrestrial planets, but none of the gas giants. They are the only real challenge left in the solar system.”

An expensive one. Have you worked out the cost?”

“As well as I can, here are the estimates. Remember though, this isn’t a one-shot mission, but a transportation system. Once it’s proved out, it can be used over and over again. And it will open up not merely Jupiter, but all the giants.”

Webster looked at the figures, and whistled.

“Why not start with an easier planet. Uranus, for example? Half the gravity, and less than half the escape velocity. Quieter weather too, if that’s the right word for it.”

Webster had certainly done his homework. But that, of course, was why he was head of Long-Range Planning.

“There’s very little saving when you allow for the extra distance and the logistics problems. For Jupiter, we can use the facilities of Ganymede. Beyond Saturn, we’d have to establish a new supply base.”

Logical, thought Webster, but he was sure that it was not the important reason. Jupiter was lord of the solar system, Falcon would be interested in no lesser challenge.

“Besides,” Falcon continued, “Jupiter is a major scientific scandal. It’s more than a hundred years since its radio storms were discovered, but we still don’t know what causes them and the Great Red Spot is as big a mystery as ever. That’s why I can get matching funds from the Bureau of Astronautics. Do you know how many probes they have dropped into that atmosphere?”

“A couple of hundred, I believe.”

“Three hundred and twenty-six, over the last fifty years, about a quarter of them total failures. Of course, they’ve learned a hell of a lot, but they’ve barely scratched the planet. Do you realise how *big* it is?”

“More than ten times the size of Earth.”

"Yes, yes, but do you know what that really means?"

Falcon pointed to the large globe in the corner of Webster's office.

"Look at India, how small it seems. Well, if you skinned Earth and spread it out on the surface of Jupiter, it would look about as big as India does here."

There was a long silence while Webster contemplated the equation:

Jupiter is to Earth as Earth is to India. Falcon had deliberately, of course, chosen the best possible example…

Was it already ten years ago? Yes, it must have been. The crash lay seven years in the past *(that* date was engraved on his heart), and those initial tests had taken place three years before the first and last flight of the *Queen Elizabeth*.

Ten years ago, then, Commander (no, Lieutenant) Falcon had invited him to a preview a three-day drift across the northern plains of India, within sight of the Himalayas. "Perfectly safe," he had promised. "It Will get you away from the office and will teach you what this whole thing is about."

Webster had not been disappointed. Next to his first journey to the Moon, it had been the most memorable experience of his life. And yet, as Falcon had assured him, it had been perfectly safe, and quite uneventful.

They had taken off from Srinagar just before dawn, with the huge silver bubble of the balloon already catching the first light of the Sun. The ascent had been made in total silence; there were none of the roaring propane burners that had lifted the hot-air balloons of an earlier age. All the heat they needed came from the little pulsed-fusion reactor, weighing only about two hundred and twenty pounds, hanging in the open mouth of the envelope. While they were climbing, its laser was zapping ten times a second, igniting the merest whiff of deuterium fuel. Once they had reached altitude, it would fire only a few times a minute, making up for the heat lost through the great gasbag overhead.

And so, even while they were almost a mile above the ground, they could hear dogs barking, people shouting, bells ringing. Slowly the vast, Sun-smitten landscape expanded around them. Two hours later, they had levelled out at three miles and were taking frequent draughts of oxygen. They could relax and admire the scenery, the on-board instrumentation was doing all the work, gathering the information that would be required by the designers of the still-unnamed liner of the skies.

It was a perfect day. The southwest monsoon would not break for another month, and there was hardly a cloud in the sky. Time seemed to have come o a stop, they resented the hourly radio reports which

interrupted their reverie. And all around, to the horizon and far beyond, was that infinite, magnificient landscape, drenched with history, a patchwork of villages, fields, temples, lakes, irrigation canals…

With a real effort, Webster broke the hypnotic spell of that ten-year-old history. It had converted him to lighter-than-air flight and it had made him realise the enormous size of India, even in a world that could be circled within ninety minutes. And yet, he repeated to himself, Jupiter is to Earth as Earth is to India …

"Granting your argument," he said, "and supposing the funds are available, there's another question you have to answer. Why should you do better than the, what is it, three hundred and twenty-six robot probes that have already made the trip?"

"I am better qualified than they were, as an observer, and as a pilot. *Especially* as a pilot. Don't forget I've more experience of lighter-than-air travel than anyone in the world."

"You could still serve as controller, and sit safely on Ganymede."

That's just the point! They've already done that. Don't you remember what killed the *Queen?"*

Webster knew perfectly well, but he merely answered: "Go on."

"Time lag, time lag! That idiot of a platform controller thought he was using a local radio circuit. But he'd been accidentally switched through a satellite. Oh, maybe it wasn't his fault, but he should have noticed. That's half-second time lag for the round trip. Even then it wouldn't have matered flying in calm air. It was the turbulence over the Grand Canyon that did it. When the platform tipped, and he corrected for that it had already tipped the other way. Ever tried to drive a car over a bumpy road with a half-second delay in the steering?"

"No, and I don't intend to try. But I can imagine it."

"Well, Ganymede is a million kilometres from Jupiter. That means a round-trip delay of six seconds. No, you need a controller on the spot to handle emergencies in real time. Let me show you something. Mind if I use this?"

"Go ahead."

Falcon picked up a postcard that was lying on Webster's desk, they were almost obsolete on Earth, but this one showed a 3-D view of a Martian landscape, and was decorated with exotic and expensive stamps. He held it so that it dangled vertically.

"This is an old trick, but helps to make my point. Place your thumb and finger on either side, not quite touching. That's right."

Webster put out his hand, almost but not quite gripping the card.

"Now catch it."

Falcon waited for a few seconds, then, without warning, he let go

of the card. Webster's thumb and finger closed on empty air.

"I'll do it again, just to show there's no deception. You see?"

Once again, the falling card had slipped through Webster's fingers.

"Now you try it on me.

This time, Webster grasped the card and dropped it without warning. It had scarcely moved before Falcon had caught it. Webster almost imagined he could hear a click, so swift was the other's reaction.

"When they put me together again," Falcon remarked in an expressionless voice, "the surgeons made some improvements. This is one of them and there are others. I want to make the most of them. Jupiter is the place where I can do it."

Webster stared for long seconds at the fallen card, absorbing the improbable colours of the Trivium Charontis Escarpment. Then he said quietly: "I understand. How long do you think it will take?"

"With your help, plus the Bureau, plus all the science foundations we can drag in, oh, three years. Then a year for trials we'll have to send in at least two test models. So, with luck, five years.

"That's about what I thought. I hope you get your luck, you've earned it. But there's one thing I won't do."

"What's that?"

"Next time you go ballooning, don't expect *me* as passenger.

3. The World of the Gods

The fall from Jupiter V to Jupiter itself takes only three and a half hours. Few men could have slept on so awesome a journey. Sleep was a weakness that Howard Falcon hated, and the little he still required brought dreams that time had not yet been able to exorcise. But he could expect no rest in the three days that lay ahead, and must seize what he could during the long fall down into that ocean of clouds, some sixty thousand miles below.

As soon as *Kon-Tiki* had entered her transfer orbit and all the computer checks were satisfactory, he prepared for the last sleep he might ever know.

It seemed appropriate that at almost the same moment Jupiter eclipsed the bright and tiny Sun as he swept into the monstrous shadow of the planet. For a few minutes a strange golden twilight enveloped the ship, then a quarter of the sky became an utterly black hole in space, while the rest was a blaze of stars. No matter how far one travelled across the solar system, they never changed these same constellations now shone on Earth, millions of miles away. The only novelties here were the small, pale crescents of Callisto and Ganymede, doubtless there were a dozen other moons up there, but they were all much too tiny, and too distant, for the unaided ~eye to pick them out.

“Closing down for two hours,” he reported to the mother ship, hanging almost a thousand miles above the desolate rocks of Jupiter V, in the radiation shadow of the tiny satellite. If it never served any other useful purpose, Jupiter V was a cosmic bulldozer perpetually sweeping up the arged particles that made it unhealthy to linger close to Jupiter. Its wake as almost free of radiation, and there a ship could park in perfect safety, while death sleeted invisibly all around.

Falcon switched on the sleep inducer, and consciousness faded swiftly out as the electric pulses surged gently through his brain. While *Kon-Tiki* fell oward Jupiter, gaining speed second by second in that enormous gravitad well, he slept without dreams. They always came when he awoke, he had brought his nightmares with him from Earth.

Yet he never dreamed of the crash itself, though he often found himself again face to face with that terrified superchimp, as he descended the spiral stairway between the collapsing gasbags. None of the simps had survived, those that were not killed outright were so badly injured that they had been painlessly “euthed’. He sometimes wondered why he dreamed only of this doomed creature which he had never met before the last minutes of its life and not of the friends

and colleagues he had lost aboard the dying ~*Queen*.

The dreams he feared most always began with his first return to conciousness. There had been little physical pain, in fact, there had been no sensation of any kind. He was in darkness and silence, and did not even seem to be breathing. And strangest of all, he could not locate his limbs. He could move neither his hands nor his feet, because he did not know Where they were.

The silence had been the first to yield. After hours, or days, he had become aware of a faint throbbing, and eventually, after long thought, he deduced that this was the beating of his own heart. That was the first of his many mistakes.

Then there had been faint pinpricks, sparkles of light, ghosts of pressures upon still-unresponsive limbs. One by one his senses had returned, and pain had come with them. He had had to learn everything anew, recapitulating infancy and babyhood. Though his memory was unaffected, and he could understand words that were spoken to him, it was months before he was able to answer except by the flicker of an eyelid. He could remember the moments of triumph when he had spoken the first word, turned the page of a book and, finally, learned to move under his own power *That* was a victory indeed, and it had taken him almost two years to prepare for it. A hundred times he had envied that dead superchimp, but *he* had been given no choice. The doctors had made their decision and now, twelve years later, he was where no human being had ever travelled before, and moving faster than any man in history.

Kon-Tiki was just emerging from shadow, and the Jovian dawn bridged the sky ahead in a titanic bow of light, when the persistent buzz of the alarm dragged Falcon up from sleep. The inevitable nightmares (he had been trying to summon a nurse, but did not even have the strength to push the button) swiftly faded from consciousness. The greatest and perhaps last adventure of his life was before him.

He called Mission Control, now almost sixty thousand miles away and falling swiftly below the curve of Jupiter, to report that everything was in order. His velocity had just passed thirty-one miles a second (*that* was one for the books) and in half an hour *Kon-Tiki* would hit the outer fringes of the atmosphere, as he started on the most difficult re-entry in the entire solar system. Although scores of probes had survived this flaming ordeal, they had been tough, solidly packed masses of instrumentation, able to withstand several hundred gravities of drag. *Kon-Tiki* would hit peaks of thirty g's, and would average more than ten, before she came to rest in the upper reaches of the Jovian atmosphere. Very carefully and thoroughly, Falcon began to attach the elaborate system of restraints that would anchor him to

the walls of the cabin. When he had finished, he was virtually a part of the ship's structure.

The clock was counting backward; one hundred seconds to re-entry. For better or worse, he was committed. In a minute and a half, he would graze the Jovian atmosphere, and would be caught irrevocably in the grip of the giant.

The countdown was three seconds late not at all bad, considering the unknowns involved. From beyond the walls of the capsule came a ghostly sighing, which rose steadily to a high-pitched, screaming roar. The noise was quite different from that of a re-entry on Earth or Mars; in this thin atmosphere of hydrogen and helium, all sounds were transformed a couple of octaves upward. On Jupiter, even thunder would have falsetto overtones.

With the rising scream came mounting weight, within seconds, he was completely immobilised. His field of vision contracted until it embraced only the clock and the accelerometer, fifteen g, and four hundred and eighty seconds to go…

He never lost consciousness, but then, he had not expected to. *Kon-Tiki* trailed through the Jovian atmosphere must be really spectacular by this time, thousands of miles long. Five hundred seconds after entry, the drag began to taper off, ten g, five g, two… Then weight vanished almost completely. He was falling free, all his enormous orbital velocity destroyed.

There was a sudden jolt as the incandescent renmants of the heat shield was jettisoned. It had done its work and would not be needed again, Jupiter could have it now. He released all but two of the restraining buckles, and waited br the automatic sequencer to start the next, and most critical, series of events.

He did not see the first drogue parachute pop out, but he could feel the slight jerk, and the rate of fall diminished imnediately. *Kon-Tiki* had lost all its horizontal speed and was going straight down at almost a thousand mi1es an hour. Everything depended on what happened in the next sixty seconds.

There went the second drogue. He looked up through the overhead window and saw, to his immense relief, that clouds of glittering foil were billowing out behind the falling ship. Like a great flower unfurling, the thousands of cubic yards of the balloon spread out across the sky, scooping p the thin gas until it was fully inflated. *Kon-Tiki's* rate of fall dropped to a few miles an hour and remained constant. Now there was plenty of time, it would take him days to fall all the way down to the surface of Jupiter.

But he would get there eventually, even if he did nothing about it. The balloon overhead was merely acting as an efficient parachute. It

was poviding no lift, nor could it do so, while the gas inside and out was the same.

With its characteristic and rather disconcerting crack the fusion reactor started up, pouring torrents of heat into the envelope overhead. Within five minutes, the rate of fall had become zero; within six, the ship had started to level. According to the radar altimeter, it had levelled out at about two hundred and sixty-seven miles above the surface, or whatever passed for surface on Jupiter.

Only one kind of balloon will work in an atmosphere of hydrogen, which was the lightest of all gases and that is a hot-hydrogen balloon. As long as the fusion reacter kept ticking over, Falcon could remain aloft, drifting across a world that could hold a hundred Pacifics. After travelling over three hunndred million miles, *Kon-Tiki* had at last begun to justify her name. She was an aerial raft, adrift upon the currents of the Jovian atmosphere.

Though a whole new world was lying around him, it was more than an hour before Falcon could examine the view. First he had to check all the capsule's systems and test its response to the controls. He had to learn how much extra heat was necessary to produce a desired rate of ascent, and how much gas he must vent in order to descend. Above all, there was the question of stability. He must adjust the length of the cables attaching his capsule to the huge, pear-shaped balloon, to damp out vibrations and get the smoothest possible ride. Thus far, he was lucky; at this level, the wind was steady, and the Doppler reading on the invisible surface gave him a ground speed of two hundred and seventeen and a half miles an hour. For Jupiter, that was modest, winds of up to a thousand had been observed.

But mere speed was, of course, unimportant, the real danger was turbulence. If he ran into that, only skill and experience and swift reaction could save him, and these were not matters that could yet be programmed into a computer.

Not until he was satisfied that he had got the feel of his strange craft did Falcon pay any attention to Mission Control's pleadings. Then he deployed the booms carrying the instrumentation and the atmospheric samplers. The capsule now resembled a rather untidy Christmas tree, but still rode smoothly down the Jovian winds while it radioed its torrents of information to the recorders on the ship miles above. And now, at last, he could look around…

His first impression was unexpected, and even a little disappointing. As far as the scale of things was concerned, he might have been ballooning over an ordinary cboudscape on Earth. The horizon seemed at a normal distance; there was no feeling at all that he was on a world eleven times the diameter of his own. Then he looked at the infrared radar, sounding the layers of atmosphere

beneath him and knew how badly his eyes had been deceived.

That layer of clouds apparently about three miles away was really more than thirty-seven miles below. And the horizon, whose distance he would have guessed at about one hundred and twenty-five, was actually eighteen hundred miles from the ship.

The crystalline clarity of the hydrogen-helium atmosphere and the enormous curvature of the planet had fooled him completely. It was even harder to judge distances here than on the Moon, everything he saw must be multiplied by at least ten.

It was a simple matter, and he should have been prepared for it. Yet somehow, it disturbed him profoundly. He did not feel that Jupiter was huge, but that *he* had shrunk to a tenth of his normal size. Perhaps, with time, he would grow accustomed to the inhuman scale of this world, yet as he stared toward that unbelievably distant horizon, he felt as if a wind colder than the atmosphere around him was blowing through his soul. Despite all his arguments, this might never be a place for man. He could well be both the first and the last to descend through the clouds of Jupiter.

The sky above was almost black, except for a few wisps of ammonia cirrus perhaps twelve miles overhead. It was cold up there, on the fringes of space but both pressure and temperature increased rapidly with depth. At the level where *Kon-Tiki* was drifting now, it was fifty below zero, and the pressure was five atmospheres. Sixty-five miles farther down, it would be as warm as equatorial Earth, and the pressure about the same as at the bottom of one of the shallower seas. Ideal conditions for life. A quarter of the brief Jovian day had already gone, the sun was halfway up the sky, but the light on the unbroken cloudscape below had a curious mellow quality. That extra three hundred million miles had robbed the Sun of all its power. Though the sky was clear, Falcon found himself continually thinking that it was a heavily overcast day. When night fell, the onset of darkness would be swift indeed; though it was still morning, there was a sense of autumnal twilight in the air. But autumn, of course, was something that never came to Jupiter. There were no seasons here.

Kon-Tiki had come down in the exact centre of the equatorial zone the least colourful part of the planet. The sea of clouds that stretched out to the horizon was tinted a pale salmon, there were none of the yellows and pinks and even reds that banded Jupiter at higher altitudes. The Great Red Spot, itself the most spectacular of all of the planet's features, lay thousands of miles to the south. It had been a temptation to descend there, but the south topical disturbance was unsually active, with currents reaching over nine undred miles an hour. It would have been asking for trouble to head into at maelstrom of unknown forces. The Great Red Spot and its mysteries would have

to wait for future expeditions.

The Sun, moving across the sky twice as swiftly as it did on Earth, was now nearing the zenith and had become eclipsed by the great silver canopy of the balloon. *Kon-Tiki* was still drifting swiftly and smoothly westward at a steady two hundred and seventeen and a half, but only the radar gave any indication of this. Was it always as calm here? Falcon asked himself.

The scientists who had talked learnedly of the Jovian doldrums, and had predicted that the equator would be the quietest place, seemed to know that they were talking about, after all. He had been profoundly sceptical of such forecasts, and had agreed with one unusually modest researcher who had told him bluntly: “There are *no* experts on Jupiter.” Well, there would be at least one by the end of this day.

If he managed to survive until then.

4. The Voices of the Deep

That first day, the Father of the Gods smiled upon him. It was as calm and peaceful here on Jupiter as it had been, years ago, when he was drifting with Webster across the plains of northern India. Falcon had time to master his new skills, until *Kon-Tiki* seemed an extension of his own body. Such luck was more than he had dared to hope for, and he began to wonder what price he might have to pay for it.

The five hours of daylight were almost over, the clouds below were full of shadows, which gave them a massive solidity they had not possessed when the Sun was higher. Colour was swiftly draining from the sky, except the west itself, where a band of deepening purple lay along the horizon. Above this band was the thin crescent of a closer moon, pale and bleached ainst the utter blackness beyond.

With a speed perceptible to the eye, the Sun went straight down over the edge of Jupiter, over eighteen hundred miles away. The stars came out in their legions and there was the beautiful evening star of Earth, on the very frontier of twilight, reminding him how far he was from home. It followed the Sun down into the west. Man's first night on Jupiter had gun.

With the onset of darkness, *Kon-Tiki* started to sink. The balloon was no longer heated by the feeble sunlight and was losing a small part of its buoyancy. Falcon did nothing to increase lift, he had expected this and was planning to descend.

The invisible cloud deck was still over thirty miles below, and he would reach it about midnight. It showed up clearly on the infrared radar, which also reported that it contained a vast array of complex carbon compounds, as well as the usual hydrogen, helium, and ammonia. The chemists were dying for samples of that fluffy, pinkish stuff; though some atmospheric probes had already gathered a few grams, that had only whetted their appetites. Half the basic molecules of life were here, floating high above the surface of Jupiter. And where there was food, could life be far away? That was the question that, after more than a hundred years, no one had been able to answer.

The infrared was blocked by the clouds, but the microwave radar sliced right through and showed layer after layer, all the way down to the hidden surface almost two hundred and fifty miles below. That was barred to him by enormous pressures and temperatures, not even robot probes had ever reached it intact. It lay in tantalising inaccessibility at the bottom of the radar screen, slightly fuzzy, and showing a curious granular structure that his equipment could not resolve.

An hour after sunset, he dropped his first probe. It fell swiftly for about sixty miles, then began to float in the denser atmosphere, sending back torrents of radio signals, which he relayed to Mission Control. Then there was nothing else to do until sunrise, except to keep an eye on the rate of descent, monitor the instruments, and answer occasional queries. While she was drifting in this steady current, *Kon-Tiki* could look after herself.

Just before midnight, a woman controller came on watch and introduced herself with the usual pleasantries. Ten minutes later she called again, her voice at once serious and excited.

"Howard! Listen in on channel forty-six high gain."

Channel forty-six? There were so many telemetering circuits that he knew the numbers of only those that were critical, but as soon as he threw the switch, he recognised this one. He was plugged in to the microphone on the probe, floating more than eighty miles below him in an atmosphere now almost as dense as water.

At first, there was only a soft hiss of whatever strange winds stirred down in the darkness of that unimaginable world. And then, out of the background noise, there slowly emerged a booming vibration that grew louder and louder, like the beating of a gigantic drum. It was so low that it was felt as much as heard, and the beats steadily increased their tempo though the pitch never changed. Now it was a swift, almost infrasonic throbbing. Then, suddenly, in mid-vibration, it stopped so abruptly that the mind could not accept the silence, but memory continued to manufacture a ghostly echo in the deepest caverns of the brain.

It was the most extraordinary sound that Falcon had ever heard, even among the multitudinous noises of Earth. He could think of no natural phenomenon that could have caused it, nor was it like the cry of any animal, not even one of the great whales…

It came again, following exactly the same pattern. Now that he was prepared for it, he estimated the length of the sequence, from first faint throb to final crescendo, it lasted just over ten seconds.

And this time there was a real echo, very faint and far away. Perhaps it was from one of the many reflecting layers, deeper in this stratified atmosphere, perhaps it was another, more distant source. Falcon waited for a second echo, but it never came.

Mission Control reacted quickly and asked him to drop another probe at once. With two microphones operating, it would be possible to find the aproximate location of the sources. Oddly enough, none of *Kon-Tiki's* own external mikes could detect anything except wind noises. The boomings, hatever they were, must have been trapped and channelled beneath an mospheric reflecting layer far below.

They were coming, it was soon discovered, from a cluster of

sources about twelve hundred miles away. The distance gave no indication of their wer, in Earth's oceans, quite feeble sounds could travel equally far. And for the obvious assumption that living creatures were responsible, the Exobiobogist quickly ruled that out.

"I'll be very disappointed," said Dr Brenner, "if there are no microanisms or plants there. But nothing like animals, because there's no free oxygen. All biochemical reactions on Jupiter must be low-energy ones, there's just no way an active creature could generate enough power to function."

Falcon wondered if this was true, he had heard the argument before, and reserved judgment.

"In any case, continued Brenner, "some of those sound waves are a hundred yards long! Even an animal as big as a whale couldn't produce them. They *must* have a natural origin."

Yes, that seemed plausible, and probably the physicists would be able to me up with an explanation. What would a blind alien make, Falcon wondered, of the sounds he might hear when standing beside a stormy sea, a geyser, or a volcano, or a waterfall? He might well attribute them to a huge beast.

About an hour before sunrise the voices of the deep died away, and Falcon began to busy himself with preparation for the dawn of his second day. *Kon-Tiki* was now only three miles above the nearest cloud layer, the external pressure had risen to ten atmospheres, and the temperature was a tropical thirty degrees. A man could be comfortable here with no more equipment than a breathing mask and the right grade of heliox mixture.

"We've some good news for you," Mission Control reported, soon after dawn. "The cloud layer's breaking up. You'll have partial clearing in an hour, but watch out for turbulence."

"I've already noticed some," Falcon answered. "How far down will I be able to see?"

"At least twelve miles, down to the second thermocline. *That* cloud deck is solid, it never breaks."

And it's out of my reach, Falcon told himself, the temperature down there must be over a hundred degrees. This was the first time that any balloonist had ever had to worry, not about his ceiling, but about his basement!

Ten minutes later he could see what Mission Control had already observed from its superior vantage point. There was a change in colour near the horizon, and the cloud layer had become ragged and lumpy, as if something had torn it open. He turned up his little nuclear furnace and gave *Kon-Tiki* another three miles of altitude, so that he could get a better view.

The sky below was clearing rapidly, completely, as if something

was dissolving the solid overcast. An abyss was opening before his eyes. A moment later he sailed out over the edge of a cloud canyon about twelve miles deep and six hundred miles wide.

A new world lay spread beneath him, Jupiter had stripped away one of its many veils. The second layer of clouds, unattainably far below, was much darker in colour than the first. It was almost salmon pink, and curiously mottled with little islands of brick red. They were all oval-shaped, with their long axes pointing east-west, in the direction of the prevailing wind. There were hundreds of them, all about the same size, and they reminded Falcon of puffy little cumulus clouds in the terrestrial sky.

He reduced buoyancy, and *Kon-Tiki* began to drop down the face of the dissolving cliff. It was then that he noticed the snow.

White flakes were forming in the air and drifting slowly downward. Yet it was much too warm for snow and, in any event, there was scarcely a trace of water at this altitude. Moreover, there was no glitter or sparkle about these flakes as they went cascading down into the depths. When, presently, a few landed on an instrument boom outside the main vieWing port, he saw that they were a dull, opaque white, not crystalline at all and quite large, several inches across. They looked like wax, and Falcon guessed that this was precisely what they were. Some chemical reaction was taking place in the atmosphere around him, condensing out the hydrocarbons floating in the Jovian air.

About sixty miles ahead, a disturbance was taking place in the cloud layer. The little red ovals were being jostled around, and were beginning to form a spiral the familiar cyclonic pattern so common in the meteorology of Earth. The vortex was emerging with astonishing speed, if that was a storm ahead, Falcon told himself, he was in big trouble.

And then his concern changed to wonder and to fear. What was developing in his line of flight was not a storm at all. Something enormous, something scores of miles across was rising through the clouds.

The reassuring thought that it, too, might be a cloud, a thunderhead boiling up from the lower levels of the atmosphere lasted only a few seconds. No, this was solid. It shouldered its way through the pink-and-salmon overcast like an iceberg rising from the deeps.

An *iceberg* floating on hydrogen? That was impossible, of course; but perhaps it was not too remote an analogy. As soon as he focused the telescope upon the enigma, Falcon saw that it was a whitish, crystalline mass, threaded with streaks of red and brown. It must be, he decided, the same stuff as the “snowflakes” falling around him, a mountain range of wax. And it was not, he soon realised, as solid as

he had thought, around the edges it was continually crumbling and re-forming…

"I know what it is," he radioed Mission Control, which for the last few minutes had been asking anxious questions. "It's a mass of bubbles, some kind of foam. Hydrocarbon froth. Get the chemists working on… Just a minute!"

"What is it?" called Mission Control. "What is it?"

He ignored the frantic pleas from space and concentrated all his mind upon the image in the telescope field. He had to be sure, if he made a mistake, he would be the laughingstock of the solar system.

Then he relaxed, glanced at the clock, and switched off the nagging voice from Jupiter V.

"Hello, Mission Control," he said, very formally. "This is Howard Falcon aboard *Kon-Tiki.* Estimated Time nineteen hours twenty-one minutes fifteen seconds. Latitude zero degrees five minutes North. Longitude one hundred five degrees forty-two minutes, System One.

"Tell Dr Brenner that there is life on Jupiter. And it's big…

5. The Wheels of Poseidon

"I'm very happy to be proved wrong," Dr Brenner radioed back cheerfully. "Nature always has something up her sleeve. Keep the long-focus camera on target and give us the steadiest pictures you can."

The things moving up and down those waxen slopes were still too far away for Falcon to make out many details, and they must have been very large to be visible at all at such a distance. Almost black, and shaped like arrowheads, they manoeuvred by slow undulations of their entire bodies, they looked rather like giant manta rays, swimming above some tropical reef.

Perhaps they were sky-borne cattle, browsing on the cloud pastures of Jupiter, for they seemed to be feeding along the dark, red-brown streaks that ran like dried-up river beds down the flanks of the floating cliffs. Occasionally, one of them would dive headlong into the mountain of foam and disappear completely from sight.

Kon-Tiki was moving only slowly with respect to the cloud layer below, it would be at least three hours before she was above those ephemeral hills. She was in a race with the Sun. Falcon hoped that darkness would not fall before he could get a good view of the mantas, as he had christened them, as well as the fragile landscape over which they flapped their way.

It was a long three hours. During the whole time, he kept the external microphones on full gain, wondering if here was the source of that booming in the night. The mantas were certainly large enough to have produced it, when he could get an accurate measurement, he discovered that they were almost a hundred yards across the wings. That was three times the length of the largest whale, though he doubted if they could weigh more than a few tons.

Half an hour before sunset, *Kon-Tiki* was almost above the "mountains'.

"No," said Falcon, answering Mission Control's repeated questions about the mantas, "they're still showing no reaction to me. I don't think they're intelligent, they look like harmless vegetarians. And even if they try to chase me, I'm sure they can't reach my altitude."

Yet he was a little disappointed when the mantas showed not the slightest interest in him as he sailed high above their feeding ground. Perhaps they had no way of detecting his presence. When he examined and photographed them through the telescope, he could see no signs of any sense organs. The creatures were simply huge black deltas, rippling over hills and valleys that, in reality, were little more substantial than the clouds of Earth. Though they looked solid, Falcon

knew that anyone who stepped on those white mountains would go crashing through them as if they were made of tissue paper.

At close quarters he could see the myriads of cellules or bubbles from which they were formed. Some of these were quite large, a yard or so in diameter and Falcon wondered in what witches' cauldron of hydrocarbons they had been brewed. There must be enough petrochemicals deep down in the atmosphere of Jupiter to supply all Earth's needs for a million years.

The short day had almost gone when he passed over the crest of the waxen hills, and the light was fading rapidly along their lower slopes. There were no mantas on this western side, and for some reason the topography was very different. The foam was sculptured into long, level terraces, like the interior of a lunar crater. He could almost imagine that they were gigantic steps leading down to the hidden surface of the planet.

And on the lowest of those steps, just clear of the swirling clouds that the mountain had displaced when it came surging skyward, was a roughly oval mass, one or two miles across. It was difficult to see, since it was only a little darker than the grey-white foam on which it rested. Falcon's first thought was that he was looking at a forest of pallid trees, like giant mushrooms that had never seen the Sun.

Yes, it must be a forest, he could see hundreds of thin trunks, springing from the white waxy froth in which they were rooted. But the trees were packed astonishingly close together, there was scarcely any space between them. Perhaps it was not a forest, after all, but a single enormous tree, like one of the giant multi-bunked banyans of the East. Once he had seen a banyan tree in Java that was over six hundred and fifty yards across; this monster was at least ten times that size.

The light had almost gone. The cloudscape had turned purple with refracted sunlight, and in a few seconds that, too, would have vanished. In the last light of his second day on Jupiter, Howard Falcon saw, or thought be saw, something that cast the gravest doubts on his interpretation of the white oval.

Unless the dim light had totally deceived him, those hundreds of thin trunks were beating back and forth, in perfect synchronism, like fronds of kelp rocking in the surge.

And the tree was no longer in the place where he had first seen it.

"Sorry about this," said Mission Control, soon after sunset, "but we think Source Beta is going to blow within the next hour. Probability seventy per cent."

Falcon glanced quickly at the chart. Beta, Jupiter latitude one hundred and forty degrees, was over eighteen thousand six hundred miles away and well below his horizon. Even though major eruptions

ran as high as ten megatons, he was much too far away for the shock wave to be a serious danger. The radio storm that it would trigger was, however, quite a different matter.

The decameter outbursts that sometimes made Jupiter the most powerful radio source in the whole sky had been discovered back in the *1950s,* to the utter astonishment of the astronomers. Now, more than a century later, their real cause was still a mystery. Only the symptoms were understood, their explanation was completely unknown.

The "volcano" theory had best stood the test of time, although no one, imagined that this word had the same meaning on Jupiter as on Earth. At frequent intervals, often several times a day, titanic eruptions occurred in the lower depths of the atmosphere, probably on the hidden surface of the planet itself. A great column of gas, more than six hundred miles high, would start boiling upward as if determined to escape into space.

Against the most powerful gravitational field of all the planets, it had no chance. Yet some traces, a mere few million tons, usually managed to reach the Jovian ionosphere, and when they did, all hell broke loose.

The radiation belts surrounding Jupiter completely dwarf the feeble Van Allen belts of Earth. When they are short-circuited by an ascending column of gas, the result is an electrical discharge millions of times more powerful than any terrestrial flash of lightning, it sends a colossal thunder clap of radio noise flooding across the entire solar system and on out to the Stars.

It had been discovered that these radio outbursts came from four main areas of the planet. Perhaps there were weaknesses there that allowed the flares of the interior to break out from time to time. The scientists on Ganymede, largest of Jupiter's many moons, now thought that they could predict the onset of a decameter storm, their accuracy was about as good as a weather forecaster's of the early 1900s.

Falcon did not know whether to welcome or to fear a radio storm, it would certainly add to the value of the mission, if he survived it. His course had been planned to keep as far as possible from the main centres of disturbance, especially the most active one, Source Alpha. As luck would have it, the threatening Beta was the closest to him. He hoped that the distance, almost three-fourths the circumference of Earth, was safe enough.

"Probability ninety per cent," said Mission Control with a distinct note of urgency. "And forget that hour. Ganymede says it may be any moment."

The radio had scarcely fallen silent when the reading on the magnetic field-strength meter started to shoot upward. Before it could

go off scale, it reversed and began to drop as rapidly as it had risen. Far away and thousands of miles below, something had given the planet's molten core a titanic jolt.

"There she blows!" called Mission Control.

"Thanks, I already know. When will the storm hit me?"

"You can expect onset in five minutes. Peak in ten.

Far around the curve of Jupiter, a funnel of gas as wide as the Pacific Ocean was climbing spaceward at thousands of miles an hour. Already, the thunderstorms of the lower atmosphere would be raging around it, but they were nothing compared with the fury that would explode when the radiation belt was reached and began dumping its surplus electrons onto the planet. Falcon began to retract all the instrument booms that were extended out from the capsule. There were no other precautions he could take. It would be four hours before the atmospheric shock wave reached him, but the radio blast, travelling at the speed of light, would be here in a tenth of a second, once the discharge had been triggered.

The radio monitor, scanning back and forth across the spectrum, still showed nothing unusual, just the normal mush of background static. Then Falcon noticed that the noise level was slowly creeping upward. The explosion was gathering its strength.

At such a distance he had never expected to *see* anything. But suddenly a flicker as of far-off heat lightning danced along the eastern horizon. Simultaneously, half the circuit breakers jumped out of the main switchboard, the lights failed, and all communications channels went dead.

He tried to move, but was completely unable to do so. The paralysis that gripped him was not merely psychological, he seemed to have lost all control of his limbs and could feel a painful tingling sensation over his entire body. It was impossible that the electric field could have penetrated this shielded cabin. Yet there was a flickering glow over the instrument board, and he could hear the unmistakable crackle of a brush discharge.

With a series of sharp bangs, the emergency systems went into operation and the overloads reset themselves. The lights flickered on again. And Falcon's paralysis disappeared as swiftly as it had come.

After glancing at the board to make sure that all circuits were back to normal, he moved quickly to the viewing ports.

There was no need to switch on the inspection lamps, the cables supporting the capsule seemed to be on fire. Lines of light glowing an electric blue against the darkness stretched upward from the main lift ring to the equator of the giant balloon, and rolling slowly along several of them were dazzling balls of fire.

The sight was so strange and so beautiful that it was hard to read

any menace in it. Few people, Falcon knew, had ever seen ball lightning from such close quarters, and certainly none had survived if they were riding a hydrogen-filled balloon back in the atmosphere of Earth. He remembered the flaming death of the *Hindenburg,* destroyed by a stray spark when she docked at Lakehurst in 1937, as it had done so often in the past, the horrifying old newsreel film flashed through his mind. But at least that could not happen here, though there was more hydrogen above his head than had ever filled the last of the Zeppelins. It would be a few billion years yet, before anyone could light a fire in the atmosphere of Jupiter.

With a sound like briskly frying bacon, the speech circuit came back to life.

"Hello, *Kon-Tiki*, are you receiving? Are you receiving?"

The words were chopped and badly distorted, but intelligible. Falcon's spirits lifted, he had resumed contact with the world of men.

"I receive you," he said. "Quite an electrical display, but no damage, so far."

"Thanks, thought we'd lost you. Please check telemetry channels three, ten, twenty-six. Also gain on camera two. And we don't quite believe the readings on the external ionisation probes…

Reluctantly Falcon tore his gaze away from the fascinating pyrotechnic "splay around *Kon-Tiki,* though from time to time he kept glancing out of the windows. The ball lightning disappeared first, the fiery globes slowly expanding until they reached a critical size, at which they time vanished in a gentle explosion. But even an hour later, there were still faint glows around the exposed metal on the outside of the capsule, and the radio circuits remained noisy until well after midnight.

The remaining hours of darkness were completely uneventful, until just before dawn. Because it came from the east, Falcon assumed that he was seeing the first faint hint of sunrise. Then he realised that it was twenty minutes too early for this, and the glow that had appeared along the horizon was moving toward him even as he watched. It swiftly detached itself from the arch of stars that marked the invisible edge of the planet, and he saw that it was a relatively narrow band, quite sharply defined. The beam of an enormous searchlight appeared to be swinging beneath the clouds.

Perhaps sixty miles behind the first racing bar of light came another, parallel to it and moving at the same speed. And beyond that another, and another, until all the sky flickered with alternating sheets of light and darkness.

By this time, Falcon thought, he had been inured to wonders, and it seemed impossible that this display of pure, soundless luminosity could present the slightest danger. But it was so astonishing, and so

inexplicable, that he felt cold, naked fear gnawing at his self-control. No man could look upon such a sight without feeling like a helpless pygmy in the presence of forces beyond his comprehension. Was it possible that, after all, Jupiter carried not only life but also intelligence? And, perhaps, an intelligence that only now was beginning to react to his alien presence?

"Yes, we see it," said Mission Control, in a voice that echoed his own awe. "We've no idea what it is. Stand by, we're calling Ganymede."

The display was slowly fading; the bands racing in from the far horizon were much fainter, as if the energies that powered them were becoming exhausted. In five minutes it was all over, the last faint pulse of light flickered along the western sky and then was gone. Its passing left Falcon with an overwhelming sense of relief. The sight was so hypnotic, and so disturbing, that it was not good for any man's peace of mind to contemplate it too long.

He was more shaken than he cared to admit. The electrical storm was something that he could understand; but *this* was totally incomprehensible.

Mission Control was still silent. He knew that the information banks up on Ganymede were now being searched as men and computers turned their minds to the problem. If no answer could be found there, it would be necessary to call Earth, that would mean a delay of almost an hour. The possibility that even Earth might be unable to help was one that Falcon did not care to contemplate.

He had never before been so glad to hear the voice of Mission Control as when Dr Brenner finally came on the circuit. The biologist sounded relieved, yet subdued, like a man who has just come through some great intellectual crisis.

"Hello, *Kon-Tiki.* We've solved your problem, but we can still hardly believe it.

"What you've been seeing is bioluminescence, very similar to that produced by microorganisms in the tropical seas of Earth. Here they're in the atmosphere, not the ocean, but the principle is the same."

"But the pattern," protested Falcon, "was so regular, so *artificial.* And it was hundreds of miles across!"

"It was even larger than you imagine; you observed only a small part of it. The whole pattern was over three thousand miles wide and looked like a revolving wheel. You merely saw the spokes, sweeping past you at about six-tenths of a mile a second. A *second!*" Falcon could not help interjecting. "No animals could inOVC that fast!"

"Of course not. Let me explain. What you saw was triggered by the shock wave from Source Beta, moving at the speed of sound."

"But what about the pattern?" Falcon insisted.

"That's the surprising part. It's a very rare phenomenon, but identical wheels of light, except that they're a thousand times smaller, have been observed in the Persian Gulf and the Indian Ocean. Listen to this: British Company's *Patna,* Persian Gulf, May 1880, 11:30 P.M… 'an enormousous wheel, whirling round, the spokes of which appeared to brush ship along. The spokes were 200 or 300 yards long… each wheel contained about sixteen spokes…' And here's one from the Gulf of Oman, May 23, 1906: 'The intensely bright luminescence approached us suddenly, shooting sharply defined light rays to the west in rapid succession, the beam from the searchlight of a warship… To the left of us, a fantastic fiery wheel formed itself, with spokes that reached as far as one could see. The whole wheel whirled around for two or three minutes.' The archive computer on Ganymede dug up about five hundred cases. It would have printed out the lot if we hadn't stopped it in time."

"I'm convinced, but still baffled."

"I don't blame you. The full explanation wasn't worked out until late in twentieth century. It seems that these luminous wheels are the results submarine earthquakes, and always occur in shallow waters where the waves can be reflected and cause standing wave patterns. Sometimes rotating wheels, sometimes, the 'Wheels of Poseidon'. The theory was finally proved by making underwater explosions and photographing the results from a satellite. No wonder sailors used to be superstitious. Who would have believed a thing like *this?*"

That was it, Falcon told himself. When Source Beta blew its top, it must have sent shock waves in all directions, through the compressed gas of the lower atmosphere, through the solid body of Jupiter itself. Meeting, crisscrossing, those waves must have cancelled here, reinforced there, the whole planet must have rung like a bell.

Yet the explanation did not destroy the sense of wonder and awe, he would never be able to forget those flickering bands of light, racing through unattainable depths of the Jovian atmosphere. He felt that he was not only on a strange planet, but in some magical realm between myth and reality.

This was a world where absolutely *anything* could happen, and no man possibly could guess what the future would bring.

And he still had a whole day to go.

6. Medusa

When the true dawn finally arrived, it brought a sudden change of weather. *Kon-Tiki* was moving through a blizzard, waxen snowflakes were falling so much, that visibility was reduced to zero. Falcon began to worry about the weight that might be accumulating on the envelope. Then he noticed that flakes settling outside the windows quickly disappeared; *Kon-Tiki's* continual outpouring of heat was evaporating them as swiftly as they arrived.

If he had been ballooning on Earth, he would also have worried about the possibility of collision. At least that was no danger here, any Jovian mountains were several hundred miles below him. And as for the floating islands of foam, hitting them would probably be like ploughing into slightly hardened soap bubbles.

Nevertheless, he switched on the horizontal radar, which until now had been completely useless; only the vertical beam, giving his distance from the invisible surface, had thus far been of any value. Then he had another surprise.

Scattered across a huge sector of the sky ahead were dozens of large and brilliant echoes. They were completely isolated from one another and apparently hung unsupported in space. Falcon remembered a phrase the earliest aviators had used to describe one of the hazards of their profession:

"clouds stuffed with rocks'. That was a perfect description of what seemed to lie in the track of *Kon-Tiki.*

It was a disconcerting sight, then Falcon again reminded himself that nothing *really* solid could possibly hover in this atmosphere. Perhaps it was some strange meteorological phenomenon. In any case, the nearest echo was about a hundred and twenty-five miles.

He reported to Mission Control, which could provide no explanation. But it gave the welcome news that he would be clear of the blizzard in another thirty minutes.

It did not warn him, however, of the violent cross wind that abruptly grabbed *Kon-Tiki* and swept it almost at right angles to its previous track. Falcon needed all his skill and the maximum use of what little control he had over his ungainly vehicle to prevent it from being capsised. Within minutes he was racing northward at over three hundred miles an hour. Then, as suddenly as it had started, the turbulence ceased, he was still moving at high speed, but in smooth air. He wondered if he had been caught in the Jovian equivalent of a jet stream.

The snow storm dissolved, and he saw what Jupiter had been preparing for him.

Kon-Tiki had entered the funnel of a gigantic whirlpool, some six hundred miles across. The balloon was being swept along a curving wall of cloud. Overhead, the Sun was shining in a clear sky, but far beneath, this great hole in the atmosphere drilled down to unknown depths until it reached a misty floor where lightning flickered almost continuously.

Though the vessel was being dragged downward so slowly that it was in no immediate danger, Falcon increased the flow of heat into the envelope until *Kon-Tiki* hovered at a constant altitude. Not until then did he abandon the fantastic spectacle outside and consider again the problem of the radar.

The nearest echo was now only about twenty-five miles away. All of them, he quickly realised, were distributed along the wall of the vortex, and were moving with it, apparently caught in the whirlpool like *Kofl-Tiki* itself.

He aimed the telescope along the radar bearing and found himself looking at a curious mottled cloud that almost filled the field of view. It was not easy to see, being only a little darker than the whirling wall of mist that formed its background. Not until he had been staring for several minutes did Falcon realise that he had met it once before.

The first time it had been crawling across the drifting mountains of foam, and he had mistaken it for a giant, many-trunked tree. Now at last he could appreciate its real size and complexity and could give it a better name to fix its image in his mind. It did not resemble a tree at all, but a jellyfish, a medusa, such as might be met trailing its tentacles as it drifted along the warm eddies of the Gulf Stream.

This medusa was more than a mile across and its scores of dangling entacles were hundreds of feet long. They swayed slowly back and forth in perfect unison, taking more than a minute for each complete undulation, just as if the creature was clumsily rowing itself through the sky.

The other echoes were more distant medusae. Falcon focused the teleope on half a dozen and could see no variations in shape or size. They all seemed to be of the same species, and he wondered just why they were drifting lazily around in this six-hundred-mile orbit. Perhaps they were dining upon the aerial plankton sucked in by the whirlpool, as *Kon-Tiki* self had been.

“You realise, Howard,” said Dr Brenner, when he had recovered from his initial astonishment, “that this thing is about a hundred thousand times as large as the biggest whale? And even if it’s only a gasbag, it must still weighs a million tons! I can’t even guess at its metabolism. It must generate megawatts of heat to maintain its buoyancy.

“But if it’s just a gasbag, why is it such a damn good radar

reflector?"

"I haven't the faintest idea. Can you get any closer?"

Brenner's question was not an idle one. If he changed altitude to take Vantage of the differing wind velocities, Falcon could approach the medusa as closely as he wished. At the moment, however, he preferred his present twenty-five miles and said so, firmly.

I see what you mean," Brenner answered, a little reluctantly. "Let's stay where we are for the present." That "we" gave Falcon a certain wry usement, an extra sixty thousand miles made a considerable difference one's point of view.

For the next two hours *Kon-Tiki* drifted uneventfully in the eye of the whirlpool, while Falcon experimented with filters and camera constantly trying to get a clear view of the medusa. He began to wonder if its coloration was some kind of camouflage; perhaps, like many animals Earth, it was trying to lose itself against its background. That was a trick used by both hunters and hunted.

Which category was the medusa? That was a question he could hardly try to have answered in the short time that was left to him. Yet just before noon, without the slightest warning, the answer came…

Like a squadron of antique jet fighters, five mantas came sweeping through the wall of mist that formed the funnel of the vortex. They were flying in a V formation directly toward the pallid grey cloud of the medusa, and there was no doubt, in Falcon's mind, that they were on the attack. He had been quite wrong to assume that they were harmless vegetarians.

Yet everything happened at such a leisurely pace that it was like watching a slow-motion film. The mantas undulated along at perhaps thirty miles an hour, it seemed ages before they reached the medusa, which continued to paddle imperturbably along at an even slower speed. Huge though they were, the mantas looked tiny beside the monster they were approaching. When they flapped down on its back, they appeared about as large as birds landing on a whale.

Could the medusa defend itself, Falcon wondered. He did not see how the attacking mantas could be in danger as long as they avoided those huge clumsy tentacles. And perhaps their host was not even aware of them, they could be insignificant parasites, tolerated as are fleas upon a dog.

But now it was obvious that the medusa was in distress. With agonising slowness, it began to tip over like a capsising ship. After ten minutes it had tilted forty-five degrees, it was also rapidly losing altitude. It was impossible not to feel a sense of pity for the beleaguered monster, and to Falcon the sight brought bitter memories. In a grotesque way, the fall of the medusa was almost a parody of the dying *Queen's* last moments.

Yet he knew that his sympathies were on the wrong side. High intelligence could develop only among predators, not among the drifting browsers of either sea or air. The mantas were far closer to him than was this monstrous bag of gas. And anyway, who could *really* sympathise with a creature a hundred thousand times larger than a whale?

Then he noticed that the medusa's tactics seemed to be having some effect. The mantas had been disturbed by its slow roll and were flapping heavily away from its back, like gorged vultures interrupted at mealtime. But they did not move very far, continuing to hover a few yards from the still-capsising monster.

There was a sudden, blinding flash of light synchronised with a crash of static over the radio. One of the mantas, slowly twisting end over end, was plummeting straight downward. As it fell, a plume of black smoke trailed behind it. The resemblance to an aircraft going down in flames was quite uncanny.

In unison, the remaining mantas dived steeply away from the medusa, gaining speed by losing altitude. They had, within minutes, vanished back into the wall of cloud from which they had emerged. And the medusa, longer falling, began to roll back toward the horizontal. Soon it was sailing along once more on an even keel, as if nothing had happened.

"Beautiful!" said Dr Brenner, after a moment of stunned silence. "Its developed electric defences, like some of our eels and rays. But that must have been about a million volts! Can you see any organs that might produce the discharge? Anything looking like electrodes?"

"No," Falcon answered, after switching to the highest power of the telescope. "But here's something odd. Do you see this pattern? Check back on the earlier images. l'm sure it wasn't there before.

A broad, mottled band had appeared along the side of the medusa. It formed a startlingly regular checkerboard, each square of which was itself speckled in a complex subpattern of short horizontal lines. They were spaced at equal distances in a geometrically perfect array of rows and columns.

"You're right," said Dr Brenner, with something very much like awe in voice. "That's just appeared. And I'm afraid to tell you what I think it is."

"Well, I have no reputation to lose, at least as a biologist. Shall I give my guess?"

"Go ahead."

"That's a large meter-band radio array. The sort of thing they used back at the beginning of the twentieth century.

"I was afraid you'd say that. Now we know why it gave such a massive echo."

"But why has it just appeared?"

"Probably an aftereffect of the discharge.

"I've just had another thought," said Falcon, rather slowly. "Do you suppose it's *listening* to us?"

"On this frequency? I doubt it. Those are meter, no, *decameter* antennas judging by their size. Hmm… that an idea!"

Dr Brenner fell silent, obviously contemplating some new line of thought. Presently he continued: "I bet they're tuned to the radio outbursts! That's something nature never got around to doing on Earth… We have animals with sonar and even electric senses, but nothing ever developed a radio sense. Why bother where there was so much light?

But it's different here. Jupiter is *drenched* with radio energy. It's worth hue using it, maybe even tapping it. That thing could be a floating power plant!"

A new voice cut into the conversation.

"Mission Commander here. This is all very interesting, but there's a much more important matter to settle. *Is it intelligent?* If so, we've got to consider the First Contact directives."

"Until I came here," said Dr Brenner, somewhat ruefully, "I would have sworn that anything that could make a shortwave antenna system *must* be intelligent. Now, I'm not sure. This could have evolved naturally. I suppose its no more fantastic than the human eye.

"Then we have to play safe and assume intelligence. For the present, terefore, this expedition comes under all the clauses of the Prime directive.

There was a long silence while everyone on the radio circuit absorbed the implications of this. For the first time in the history of space flight, the rules that had been established through more than a century of argument, might have to be applied. Man had, it was hoped, profited from his mistakes on Earth. Not only moral considerations, but also his own self-interest demanded that he should not repeat them among the planets. It could be disastrous to treat a superior intelligence as the American settlers had treated the Indians, or as almost everyone had treated the Africans.

The first rule was: keep your distance. Make no attempt to approach, or even to communicate, until "they" have had plenty of time to study you. Exactly what was meant by "plenty of time', no one had ever been able to decide. It was left to the discretion of the man on the spot.

A responsibility of which he had never dreamed had descended upon Howard Falcon. In the few hours that remained to him on Jupiter, he might become the first ambassador of the human race.

And *that* was an irony so delicious that he almost wished the

surgeons had restored to him the power of laughter.

7. Prime Directive

It was growing darker, but Falcon scarcely noticed as he strained his eyes toward that living cloud in the field of the telescope. The wind that was steadily sweeping *Kon-Tiki* around the funnel of the great whirlpool had now brought him within twelve miles of the creature. If he got much closer than six, he would take evasive action. Though he felt certain that the medusa's electric weapons were short ranged, he did not wish to put the matter to the test. That would be a problem for future explorers, and he wished them luck.

Now it was quite dark in the capsule. That was strange, because sunset was still hours away. Automatically, he glanced at the horizontally scanning radar, as he had done every few minutes. Apart from the medusa the was studying, there was no other object within about sixty miles of him.

Suddenly, with startling power, he heard the sound that had come booming out of the Jovian night, the throbbing beat that grew more and more rapid, then stopped in mid-crescendo. The whole capsule vibrated with it like a pea in a kettledrum.

Falcon realised two things almost simultaneously during the sudden, aching silence. *This* time the sound was not coming from thousands of miles away, over a radio circuit. It was in the very atmosphere around him.

The second thought was even more disturbing. He had quite forgotten, it was inexcusable, but there had been other apparently more important things on his mind, that most of the sky above him was completely blanked out by *Kon-Tikj's* gasbag. Being lightly silvered to conserve its heat, the great balloon was an effective shield both to radar and to vision.

He had known this, of course, it had been a minor defect of the design, tolerated because it did not appear important. It seemed very important to Howard Falcon now as he saw that fence of gigantic tentacles, thicker than the trunks of any tree, descending all around the capsule.

He heard Brenner yelling: "Remember the Prime directive! Don't alarm it!" Before he could make an appropriate answer that overwhelming drumbeat started again and drowned all other sounds.

The sign of a really skilled test pilot is how he reacts not to foreseeable emergencies, but to ones that nobody could have anticipated. Falcon did not hesitate for more than a second to analyse the situation. In a lightning-swift movement, he pulled the rip cord.

That word was an archaic survival from the days of the first hydrogen balloons, on *Kon-Tiki,* the rip cord did not tear open the

gasbag, but merely operated a set of louvres around the upper curve of the envelope. At once the hot gas started to rush out, *Kon-Tiki,* deprived of her lift, began to fall swiftly in this gravity field two and a half times as strong as Earth's.

Falcon had a momentary glimpse of great tentacles whipping upward and away. He had just time to note that they were studded with large bladders or sacs, presumably to give them buoyancy, and that they ended in a multitude of thin feelers like the roots of a plant. He half expected a bolt of lightning but nothing happened.

His precipitous rate of descent was slackening as the atmosphere thickened and the deflated envelope acted as a parachute. When *Kon-Tiki* had dropped about two miles, he felt that it was safe to close the louvres again. By the time he had restored buoyancy and was in equilibrium once more, he had lost another mile of altitude and was getting dangerously near his safety limit.

He peered anxiously through the overhead windows, though he did not expect to see anything except the obscuring bulk of the balloon. But he had sideslipped during his descent, and part of the medusa was just visible a couple of miles above him. It was much closer than he expected and it was still coming down, faster than he would have believed possible.

Mission Control was calling anxiously. He shouted: "I'm OK, but it's still coming after me. I can't go any deeper."

That was not quite true. He could go a lot deeper, about one hundred and eighty miles. But it would be a one-way trip, and most of the journey Would be of little interest to him.

Then, to his great relief, he saw that the medusa was levelling off, not quite a mile above him. Perhaps it had decided to approach this strange intruder with caution, or perhaps it, too, found this deeper layer Uncomfortably hot. The temperature was over fifty degrees centigrade, and Falcon wondered how much longer his life-support system could handle matters.

Dr Brenner was back on the circuit, still worrying about the Prime directive.

"Remember, it may only be inquisitive!" he cried, without much conviction. "Try not to frighten it!"

Falcon was getting rather tired of this advice and recalled a TV discussion he had once seen between a space lawyer and an astronaut. After the full implications of the Prime directive had been carefully spelled out, the incredulous spacer had exclaimed: "Then if there was no alternative, I must sit still and let myself be eaten?" The lawyer had not even cracked a smile when he answered: "That's an *excellent* summing up."

It had seemed funny at the time, it was not at all amusing now.

And then Falcon saw something that made him even more unhappy. The medusa was still hovering about a mile above him, but one of its tentacles was becoming incredibly elongated, and was stretching down toward *Kon Tiki,* thinning out at the same time. As a boy he had once seen the funnel of a tornado descending from a storm cloud over the Kansas plains. The thing coming toward him now evoked vivid memories of that black, twisting snake in the sky.

"I'm rapidly running out of options," he reported to Mission Control. "I now have only a choice between frightening it, and giving it a bad stomach-ache. I don't think it will find *Kon-Tiki* very digestible, if that's what it has in mind."

He waited for comments from Brenner, but the biologist remained silent.

"Very well. It's twenty-seven minutes ahead of time, but I'm starting the ignition sequencer. I hope I'll have enough reserve to correct my orbit later."

He could no longer see the medusa; once more it was directly overhead. But he knew that the descending tentacle must now be very close to the balloon. It would take almost five minutes to bring the reactor up to full thrust…

The fusor was primed. The orbit computer had not rejected the situation as wholly impossible. The air scoops were open, ready to gulp in tons of the surrounding hydrohelium on demand. Even under optimum conditions, this would have been the moment of truth, for there had been no way of testing how a nuclear ramjet would *really* work in the strange atmosphere of Jupiter.

Very gently something rocked *Kon-Tiki.* Falcon tried to ignore it.

Ignition had been planned at six miles higher, in an atmosphere of less than a quarter of the density and thirty degrees cooler. Too bad.

What was the shallowest dive he could get away with, for the air scoops to work? When the ram ignited, he'd be heading toward Jupiter with two and a half g's to help him get there. Could he possibly pull out in time?

A large, heavy hand patted the balloon. The whole vessel bobbed up and down, like one of the yo-yos that had just become the craze on Earth.

Of course, Brenner *might* be perfectly right. Perhaps it was just trying to be friendly. Maybe he should try to talk to it over the radio. Which should it be: "Pretty pussy'? "Down, Fido'? Or "Take me to your leader'?

The tritium-deuterium ratio was correct. He was ready to light the candle, with a hundred-million-degree match.

The thin tip of the tentacle came slithering around the edge of the

balloon some sixty yards away. It was about the size of an elephant's trunk, and by the delicate way it was moving appeared to be almost as sensitive. Tbere were little palps at its end, like questing mouths. He was sure that Dr Brenner would be fascinated.

This seemed about as good a time as any. He gave a swift scan of the entire control board, started the final four-second ignition count, broke the safety seal, and pressed the JETTISON switch.

There was a sharp explosion and an instant loss of weight. *Kon-Tiki* was falling freely, nose down. Overhead, the discarded balloon was racing upward, dragging the inquisitive tentacle with it. Falcon had no time to see the gasbag actually hit the medusa, because at that moment the ramjet ignited and he had other matters to think about.

A roaring column of hot hydrohelium was pouring out of the reactor nozzles, swiftly building up thrust, but *toward* Jupiter, not away from it. He could not pull out yet, for vector control was too sluggish. Unless he could gain complete control and achieve horizontal flight within the next five seconds, the vehicle would dive too deeply into the atmosphere and ould be destroyed.

With agonising slowness, those five seconds seemed like fifty, he managed to flatten out, then pull the nose upward. He glanced back only once and caught a final glimpse of the medusa, many miles away. *Kon-Tiki's* discarded gasbag had apparently escaped from its grasp, for he could see no sign of it.

Now he was master once more, no longer drifting helplessly on the winds of Jupiter, but riding his own column of atomic fire back to the stars.

Falcon was confident that the ramjet would steadily give him velocity and altitude until he had reached near-orbital speed at the fringes of the atmosphere. Then, with a brief burst of pure rocket power, he would regain freedom of space.

Halfway to orbit, he looked south and saw the tremendous enigma of the reat Red Spot, that floating island twice the size of Earth, coming up over the horizon. He stared into its mysterious beauty until the computer informed him that conversion to rocket thrust was only sixty seconds ahead. He tore his gaze reluctantly away.

"Some other time," he murmured.

"What's that?" said Mission Control. "What did you say?"

"It doesn't matter," he replied.

8. Between Two Worlds

You're a hero now, Howard," said Webster, "not just a celebrity. You've given them something to think about, injected some excitement into their lives. Not one in a million will actually travel to the Outer Giants, but the hole human race will go in imagination. And that's what counts."

"I'm glad to have made your job a little easier."

Webster was too old a friend to take offence at the note of irony. Yet it surprised him. And this was not the first change in Howard that he had noticed since the return from Jupiter.

The Administrator pointed to the famous sign on his desk, borrowed from an impresario of an earlier age: ASTONISH ME.

"I'm not ashamed of my job. New knowledge, new resources, they're all very well. But men also need novelty and excitement. Space travel has become routine, you've made it a great adventure once more. It will be a long, long time before we get Jupiter pigeonholed. And maybe longer still before we understand those medusae. I still think that one *knew* where your blind spot was. Anyway, have you decided on your next move? Saturn, Uranus, Neptune, you name it."

"I don't know. I've thought about Saturn, but I'm not really needed there. It's only one gravity, not two and a half like Jupiter. So men can handle it."

Men, thought Webster. He said "men'.

He's never done that before. And when did I last hear him use the word "we'? He's changing, slipping away from us…

"Well," he said aloud, rising from his chair to conceal his slight uneasiness, "let's get the conference started. The cameras are all set up and everyone's waiting. You'll meet a lot of old friends."

He stressed the last word, but Howard showed no response. The leathery mask of his face was becoming more and more difficult to read. Instead, he rolled back from the Administrator's desk, unlocked his undercarriage so that it no longer formed a chair, and rose on his hydraulics to his full seven feet of height. It had been good psychology on the part of the surgeons to give him that extra twelve inches, to compensate somewhat for all that he had lost when the *Queen* had crashed.

Falcon waited until Webster had opened the door, then pivoted neatly on his balloon tires and headed for it at a smooth and silent twenty miles an hour. The display of speed and precision was not flaunted arrogantly, rather, it had become quite unconscious.

Howard Falcon, who had once been a man and could still pass for one over a voice circuit, felt a calm sense of achievement, and, for the

first time in years, something like peace of mind. Since his return from Jupiter the nightmares had ceased. He had found his role at last.

He now knew why he had dreamed about that superchimp aboard the doomed *Queen Elizabeth*. Neither man nor beast, it was between worlds; and so was he.

He alone could travel unprotected on the lunar surface. The life support system inside the metal cylinder that had replaced his fragile body functioned equally well in space or under water. Gravity fields ten times that of Earth were an inconvenience, but nothing more. And no gravity was best of all…

The human race was becoming more remote, the ties of kinship tenuous. Perhaps these air-breathing, radiation-sensitive bundles of stable carbon compounds had no right beyond the atmosphere, they should stick to their natural homes, Earth, Moon, Mars.

Some day the real masters of space would be machines, not men, he was neither. Already conscious of his destiny, he took a somber pride in his unique loneliness the first immortal midway between two orders of creation.

He would, after all, be an ambassador, between the old and the new, between the creatures of carbon and the creatures of metal who must one day supersede them.

Both would have need of him in the troubled centuries that lay ahead.